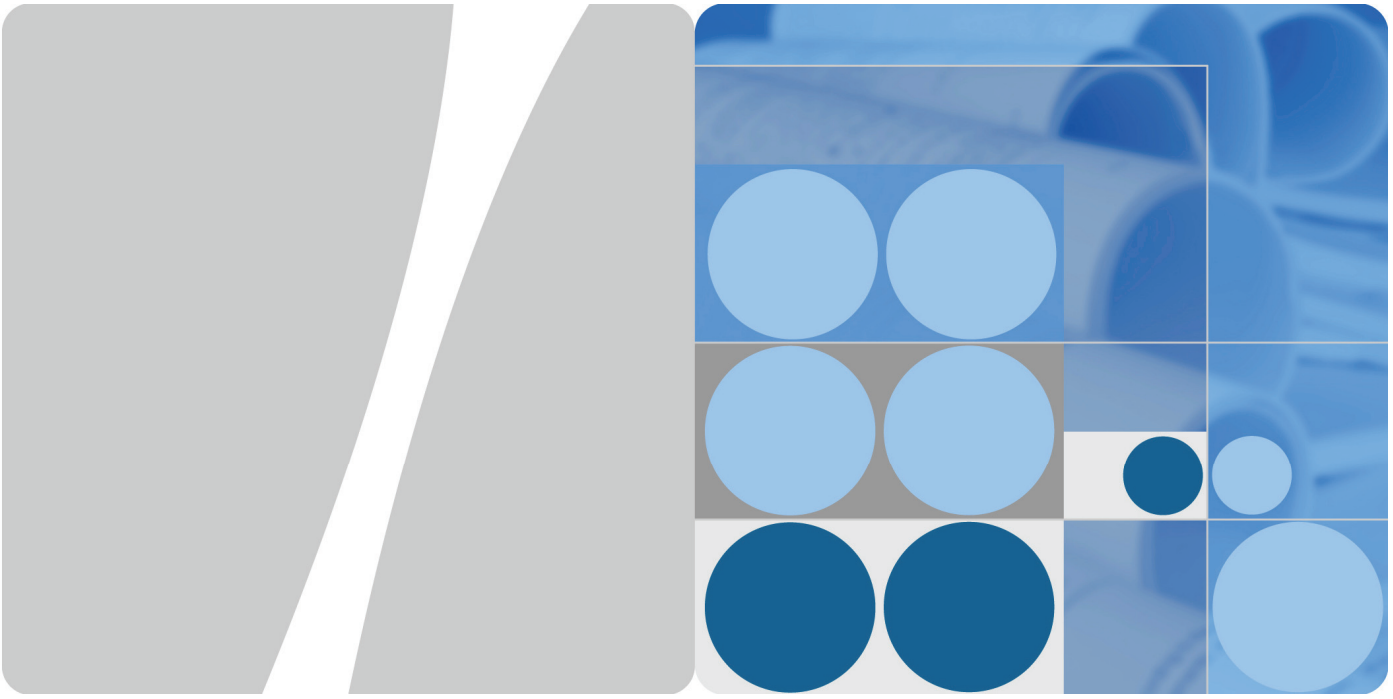
Product Description



HUAWEI B683 Wireless Gateway
V100R001

Issue 01

Date 2010-11-19

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Some features of the product and its accessories described herein rely on the software installed, capacities and settings of local network, and may not be activated or may be limited by local network operators or network service providers, thus the descriptions herein may not exactly match the product or its accessories you purchase.

About This Document

Summary

This document provides information for product features, main functions and services, technical specifications and technical references. .

This document includes:

Chapter	Details
1 Product Overview	Describes the appearance and main services of product
2 Features	Describes the product features
3 Technical Specifications	Describes the specifications of product hardware, software and user interface
4 Services and Applications	Describes the main functions and applications
5 System Structure	Describes the product system structure
6 Technical References	Describes Standards and Communication Protocols of the DATACOM Products
7 Packing List	Describes the devices and accessories of the product

NOTE

The document is an invitation to offer but not an offer. It is intended to describe the general features and functions of products. The features and functions of certain products vary with requirements of customers.

History

Issue	Details	Date
01	Initial draft completed.	2010-11-19

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1 Product Overview

The B683 wireless gateway (hereinafter refereed to as the B683) is a wireless HSPA+ 3G gateway, which provides users with flexible and diversified 3G and 2G data access services.

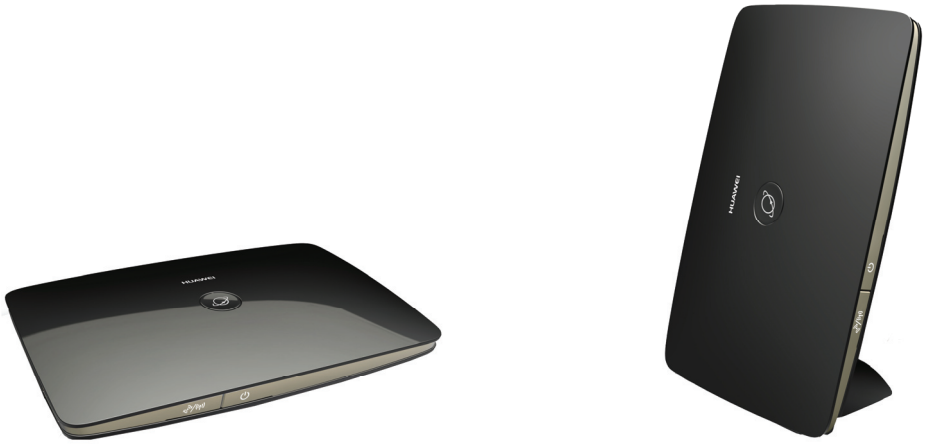
B683 supports the following standards:

- HSPA+ (High Speed Packet Access Plus)
- HSUPA (High Speed Uplink Packet Access)
- HSDPA (High Speed Downlink Packet Access)
- WCDMA (Wideband Code Division Multiple Access)
- GSM (Global System for Mobile Communications)
- GPRS (General Packet Radio Service（System）
- EDGE (Enhanced Data Rates for Global Evolution)

B683 supports wired and wireless network access, and provides data routing service.

B683 provides the following services:

- Data service
- SMS
- Security Service
- Local maintenance management function



B683 appearance

2 Features

The B683 mainly supports the following features:

- Multiple network environments. Supports HSPA+/HSUPA/HSDPA/WCDMA/GSM/GPRS/EDGE
- High speed experience. Supports data services of maximum rate of HSPA+ (DL 28Mbit/s; UL5.76Mbit/s), HSPA (DL 7.2Mbit/s; UL5.76Mbit/s), 384kbit/s WCDMA, 236.8kbit/s EDGE, and 85.6kbit/s GPRS
- 802.11b/g/n
- WPS
- Built-in DHCP Server, DNS RELAY and NAT
- Security services. Provides instant protection to block potential security risks and intrusion attempts.
- Intuitionistic and convenient Web-based management.
- Windows 2000/ Windows XP/ Windows Vista/ Windows 7
- User-friendly design of LED indicator. Easy to observe the status of equipment
- Receiving diversity and load equalizer
- Built-in WCDMA/GSM and WLAN high gain antenna
- External main diversity antenna interface
- USB 2.0 host interface

3 Technical Specifications

3.1 Hardware Specifications

Table 3-1 Technical specifications of the B683

Item	Description	
Technical standard	• WAN: HSPA+/HSUPA/HSDPA/WCDMA/GSM/GPRS/EDGE • LAN: IEEE 802.3/802.3u • WLAN: IEEE 802.11b/g/n	
Working frequency band	HSPA/WCDMA: 2100/900MHz	
	WLAN: 2.4GHz～2.4835GHz	
	GSM/GPRS/EDGE: 1900M/1800M/900M/850M	
External interface/ Indicators	• One power switch: ON/OFF • One WLAN/WPS button • One Reset button • One dialing button • External antenna interface (SMA) • Four auto-sensing Ethernet interfaces (RJ45 and MDI/MDIX auto-sensing): 10/100Base-T • One POWER (Power Adapter) interface • One USB 2.0 host interface • One Internet status indicator • One WLAN/WPS indicator • One USB indicator • One Power indicator • Four LINK/ACTIVE indicators (indicating the connection status of the corresponding Ethernet interface)	
Maximum	WCDMA	24dBm (+1/-3)

transmit power	WLAN	• 802.11b: 17dBm (+2/-2) • 802.11g: 13dBm (+2/-2) • 802.11n: 12dbm (+2/-2)
	GSM	• 850M/900M, 33dBm (+2/-2) • 1800M/1900M, 30dBm (+2/-2)
Receiving sensitivity	WCDMA	• Band VIII: dBm/3.84 MHz，-114DPCH_Ec <REFSENS>; -103.7<REF-or> • Band I: dBm/3.84 MHz; -117DPCH_Ec <REFSENS>；-106.7<REF-or>
	GSM	850/900/1800/1900M, better than -102dBm
	WLAN	• 802.11g: -65 dBm@54 Mbps • 802.11b: -76 dBm@11 Mbps/-82 dBm@1 Mbps • 802.11n: -64dBm@MCS7(BW=20MHz)/-61dBm@MCS7(BW=40MHz)
Power consumption	<10 W	
AC/DC power supply	• AC: 100V - 240V • DC: 5V, 2A	
Dimensions (W×D×H)	180mm × 123mm × 32.5mm	
Weight	< 300g (excluding the power adapter)	
Temperature	• Working temperature: -10℃- +45℃ • Storage temperature: -20℃ - +70℃	
Humidity	5% - 95%	

3.2 Antenna Specifications

3.2.1 Build-in Antenna

Table 3-2 GSM/WCDMA main antenna specifications

Item	Description
Frequency	• 824～960MHz • 1710～1990MHz • 1920～2170MHz
Input impedance	50 Ω

Item	Description
Standing wave ratio	< 3.0 (after being matched) All frequency points
H side gain	≥1dBi (horizontal level peak value)
Polarization	Linear polarization

Table 3-3 WCDMA sub diversity antenna specifications

Item	Description
Frequency	• 869～960MHz • 1805～1880MHz • 2110～2170MHz
Input impedance	50 Ω
Standing wave ratio	< 3.0 (after being matched, all frequency points)
Gain	≥ 0dBi (horizontal level peak value)
Polarization	Linear polarization

Table 3-4 WLAN main diversity antenna specifications

Item	Description
Frequency	2.4GHz～2.4835GHz
Input impedance	50 Ω
Standing wave ratio	< 2.5
H side gain	Horizontal level minimum value: >-2dBi Horizontal level average value: >-1dBi
Polarization	Linear polarization

Table 3-5 External GSM/WCDMA main diversity antenna specifications(Optional)

NOTE

- Signals may be weak in some areas; thus, you can choose whether to use the external antenna.
- The external antenna is an optional accessory.
- The external antenna can be used indoor only.

Item	Description
Frequency	• 824～960MHz • 1710～1990MHz • 1920～2170MHz
Input impedance	50 Ω
Standing wave ratio	< 3 (after being matched, all frequency points)
H side gain	≥ 2dBi (horizontal level peak value)
Polarization	Linear polarization (vertical)
Length of the connection cable	1m
Interface standard	SMA-C-J1.5

3.3 Software Specifications

Table 3-6 Software specifications

Item	Description
Gateway	**Router**: • Supports static routing • Supports the default routing (the routing address is 0.0.0.0). You can set the WAN connection to the default routing to generate default routing table items
	Supports ARP
	Supports ICMP
	Supports DNS Relay
	NAT: • Supports NAT, NAPT (compliant with RFC2663, RFC3022 and RFC3027) • Supports fragment message identification for normal NAT • Supports ALG • Supports NAT traverse of VPN related protocol (PPTP and L2TP)

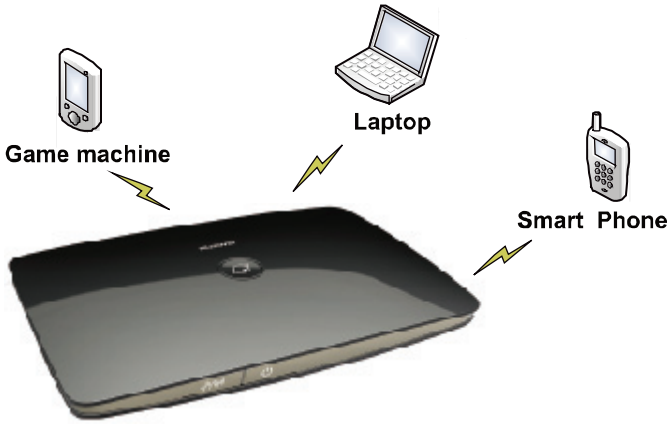
Item	Description
	DHCP Server: • The default IP addresses of the DHCP server is from 192.168.1.100 to 192.168.1.200. The default gateway address is 192.168.1.1 • The default DHCP lease is 24 hours • The DHCP Server can be enabled or disabled • The address pool of the DHCP server can be configured. • The lease can be configured • The IP address status can be displayed, such as the host name, MAC address, IP address, and remaining lease
Data service	• **HSPA+**: DL 28Mbit/s UL 5.76Mbit/s • **HSPA**: DL 7.2Mbit/s UL 5.76Mbit/s • **WCDMA PS**: DL 384kbit/s UL 384kbit/s • **WCDMA CS**: DL 64kbit/s UL 64kbit/s • **EDGE**: DL 236.8kbit/s UL 236.8kbit/s • **GPRS**: DL 85.6kbit/s UL 85.6kbit/s • **GSM CS**: DL 14.4kbit/s UL 14.4kbit/s
	WLAN: • 802.11b: 11Mbit/s, 5.5Mbit/s, 2Mbit/s, 1Mbit/s • 802.11g: 54Mbit/s, 48Mbit/s, 36Mbit/s, 24Mbit/s, 18M bit/s, 12Mbit/s, 9Mbit/s, 6Mbit/s • 802.11n: HTC40 MCS7(300M)、HTC20 MCS7(144.4M)
SMS	• Writing/Sending/Receiving • Group sending (up to 10 contacts at a time) • Storage: Up to 250 messages can be saved in SIM card of the B683 • Messages prompt • SMS center number settings
Firewall setup	• Firewall Switch • LAN MAC Filter • URL Filter • LAN IP Filter • Virtual Server • Port triggering • DMZ Service • UPnP Service • ACL settings • ALG settings

Item	Description
LAN	• 10Mbit/s and 100Mbit/s auto-negotiation • MDI/MDIX auto-sensing • IEEE802.3/802.3u is compatible
WLAN	SSID broadcast and hiding are supported.
	Supports Wi-Fi
	Supports WPS
	Authentication: • Open System authentication • Shared Key authentication • ASCII • 64/128-digit WEP encryption • WPA-PSK/ WPA2-PSK encryption • TKIP ciphering algorithm • AES ciphering algorithm • TKIP and AES ciphering algorithm synchronously
	MAC address authentication: • White list • Black list • The preceding two lists cannot coexist. • Up to 16 MAC address items.
	Ratio adjustment: • Automatically • Manually
	STA management: • Supports inquiry of STA status • Supports limit of access users (up to 32 users)
System requirement	• Windows 2000, Windows XP, Windows Vista, Windows 7 • Your computer's hardware system should meet or exceed the recommended system requirements for the installed version of OS • Internet Explorer: IE 6.0、IE7.0、IE8.0/ Firefox 3.5、Firefox 3.6/ Safari 5.0/Opera 10.5/Chrome 5.1 • Display resolution: 1024*768 or above

4 Services and Applications

4.1 Wireless Router

The B683 can be used as a wireless router when the Wi-Fi is enabled. You can access the Internet service through setting up the wireless network connection with the B683.



4.2 SMS

The B683 supports message writing/sending/receiving and group sending (up to 10 contacts at a time). You can manage messages through the Web page, such as inbox, outbox, draft.

4.3 Security Service

Its various security features, such as the firewall, user authentication, and PIN protection, protect users against security threats from the Internet when users are using network services.

4.4 Local management and maintenance

The B683 supports local configuration through the Web page. You can accomplish device management, network configuration and ensure normal and stable performance.

5 System Structure

Figure 5-1shows the system architecture.

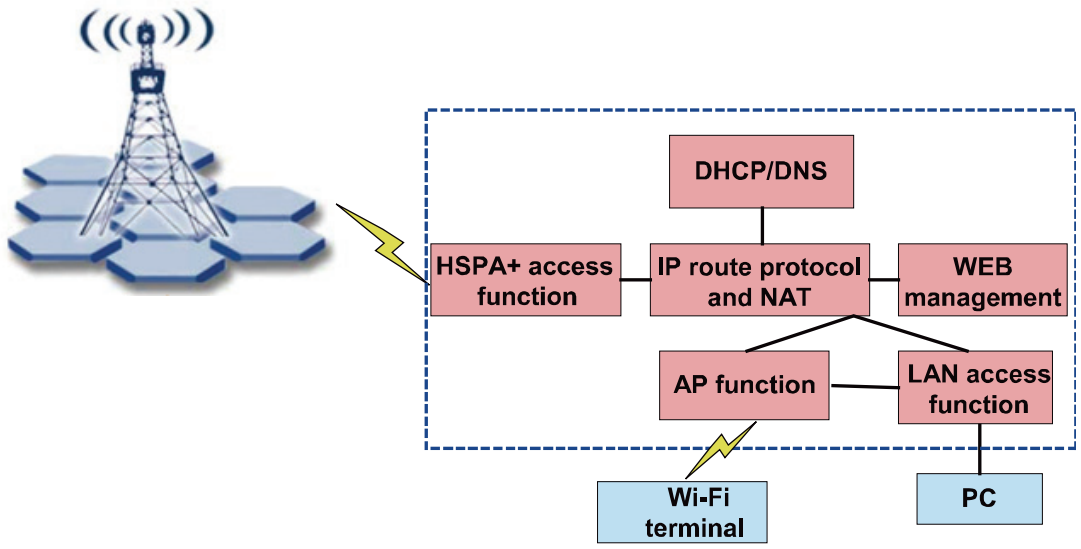


Figure 5-1 System architecture

The following describes modules shown in Figure 5-1.

- HSPA+ access: The B683 adopts the HSPA+ access technology at the WAN side. The B683 can access the 3G broadband packet-based network through the point-to-point protocol (PPP) dial-up.
- AP function: An 802.11 b/g/n-compliant WLAN AP interface is provided, used for wireless networking at home. The interface is compliant with the IEEE802.11 b/g/n standard and the WPA-PSK /WPA2-PSK/WEP security authentication.
- DHCP/DNS: The DHCP server dynamically allocates IP addresses to PCs. The DNS parses domain names.
- Web management: You can configure, modify and query the configuration information of the B683.
- Routing and NAT: High-speed routing capability. With the built-in NAT, the B683, together with 3G terminals, can provide flexible broadband access solutions and networking schemes.

6 Technical References

6.1 Standards and Communication Protocols

6.1.1 Standards and Communication Protocols of the DATACOM Products

Table 6-1 Standards and communication protocols of the DATACOM products

Item	Description
Physical layer	RFC894
PPP	RFC1915, RFC1962, RFC1994, RFC2433, RFC2759, RFC1332, RFC1877, RFC1471, RFC1570, RFC2484, RFC1717, RFC1934, RFC1990, RFC1334, RFC1974, RFC1661
ARP	RFC826
IP	RFC791, RFC1122, RFC1071, RFC1141, RFC1624, RFC792, RFC950, RFC1256
ICMP	RFC792, RFC950, RFC1256
TCP	RFC793
UDP	RFC768
DHCP	RFC1531, RFC1533
NAT	RFC1631

6.1.2 Standards and Communication Protocols of the Wireless Interface

The wireless interface conforms to the WCDMA R99, R4, R5, R6, R7 standards.

Table 6-2 Standards and communication protocols of the wireless interface

Item	Description
Layer1 Specifications (Physical)	Physical Layer – General Description TS 25.201 (V3.1.0) Physical Channels and Mapping of Transport Channels onto Physical Channels (FDD) TS 25.211 (V3.5.0) Multiplexing and Channel Coding (FDD) TS 25.212 (V3.5.0) Spreading and Modulation (FDD) TS 25.213 (V3.4.0) Physical Layer – Procedures (FDD) TS 25.214 (V3.5.0) Physical Layer – Measurements (FDD) TS 25.215 (V3.5.0)
Layer 2 Specifications (MAC/RLC)	MAC Protocol Specification TS 25.321 (V3.6.0) RLC Protocol Specification TS 25.322 (V3.5.0)
Layer 3 Specifications (RRC)	UE Interlayer Procedures in Connected Mode TS 25.303 (V3.6.0) UE Procedures in Idle Mode TS 25.304 (V3.5.0) RRC Protocol Specification TS 25.331 (V3.5.0)
Layer 3 NAS/Core Network (MCM)	Service accessibility TS 22.011(Release 5, June 2005) Non-Access-Stratum (NAS) functions related to Mobile Station (MS) in idle mode TS 23.122 (Release 5, June 2005) Mobile Radio Interface Signaling Layer 3-General Aspects TS 24.007 (Release 5, June 2005) Mobile Radio Interface Layer 3 Specification-Core Network TS 24.008 (Release 5, June 2005)
GSM Protocol Specifications	Mobile Radio Interface Layer 3 Specification, Radio Re source Control Protocol TS 04.18 (V8.10.0) Mobile Station - Base Station System (MS - BSS) interface; Data Link (DL) Layer Specification TS 04.06 (V8.11.0) Digital Cellular Telecommunications System (Phase 2+); Multiplexing and Multiple Access on the Radio Path TS 05.02 (V8.9.0) Technical Specification Group GERAN; Channel coding TS 05.03 (V8.6.1) Digital Cellular Telecommunications System (Phase 2+); Radio Subsystem Link Control TS 05.08 (V8.a.0) Digital Cellular Telecommunications System (Phase 2+); Radio Subsystem Synchronization TS 05.10 (V8.8.0)

Item	Description
GPRS Protocol Specifications	Overall Description of the GPRS Radio Interface; stage 2 TS 3.64 (V8.8.0) Mobile Radio Interface Layer 3 Specification TS 04.08 (V8.0.0) Mobile Radio Interface Layer 3 Specification: Radio Resource Control Protocol TS 04.18 (V8.10.0) General Packet Radio Service (GPRS): Mobile Station (MS) – Base Station System (BSS) interface; Radio Link Control / Medium Access Control (RLC/MAC) protocol TS 04.60 (V8.10.0) Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) Layer Specification TS 04.64 (V8.6.0) Mobile Station - Serving GPRS Support Node (MS-SGSN); Sub-network Dependent Convergence Protocol (SNDCP) TS 04.65 (V8.1.0) Multiplexing and Multiple Access on the Radio Path TS 05.02 (V8.9.0) Channel Coding TS 05.03 (V8.6.1) Modulation TS 05.04 (V8.3.0) Radio Transmission and Reception TS 05.05 (V8.10.0) General Packet Radio Service (GPRS); Stage 1 TS 22.060 (V3.5.0) Mobile Execution Environment (MexE) TS 23.057 (V3.4.0) General Packet Radio Service (GPRS) Service description; stage 2 TS 23.060 (V8.8.0)
General Specifications	UE Capability Requirements TR 21.904 (V3.3.0) UE Radio Access Capabilities TR 25.926 (V3.2.0) Vocabulary TR 25.990 (V3.0.0) Radio Interface Protocol Architecture TS 25.301 (V3.6.0) Services Provided by the Physical Layer TS 25.302 (V3.7.0) Synchronization in UTRAN Stage 2 TS 25.402 (V3.4.0
Performance/Test Specifications	UE Radio Transmission and Reception (FDD) TS 25.101 (V3.5.0) Common Test Environments for User Equipment (UE) TS 34.108 (V3.2.0) Special Conformance Testing Functions TS 34.109 (V3.2.0) Terminal Conformance Specification TS 34.121 (V3.3.0) User Equipment (UE) Conformance Specification; Part 1: Protocol Conformance TS 34.123-1 (V3.2.0) User Equipment (UE) Conformance Specification; Part 2: Protocol Conformance TS 34.123-2 (V3.2.0)

Item	Description
Performance/Test Specifications	Terminal Conformance Specification, Radio Transmission and Reception (FDD) TS 34.121 (V3.3.0) User Equipment (UE) Conformance Specification; Part 1: Protocol Conformance TS 34.123-1 (V3.2.0) S48 User Equipment (UE) Conformance Specification; Part 2: Implementation Conformance Statement (ICS) Specification TS 34.123-2 (V3.2.0)
USIM Specifications	SIM and IC Card Requirements TS 21.111 (V3.3.0) 3rd Gen. Partnership Proj Tech. Spec. Group Terminals; USIM App. Toolkit (USAT) TS 31.111 (V3.3.0)

7 Packing List

Table 7-1 shows the devices and accessories of the B683.

Table 7-1 Packing list

Description	Quantity	Remarks
Wireless Gateway	1	Standard
Quick Start	1	Standard
Power supply adapter	1	Standard
Warranty card	1	Optional
External Antenna	1	Optional
Ethernet cable	1	Optional
Pedestal	1	Optional

A Acronyms and Abbreviations

3G	The Third Generation
A	
AC	Alternating Current
ARP	Address Resolution Protocol
AP	Access Point
APN	Access Point Name
D	
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name Server
DL	down link, downlink
H	
HSPA	High Speed Packet Access
HSPA+	High Speed Packet Access Plus
HSDPA	High Speed Downlink Packet Access
HSUPA	High Speed Uplink Packet Access
HLR	Home Location Register
I	
IP	Internet Protocol
ICMP	Internet Control Message Protocol
L	
LAN	Local Area Network
LED	Light Emitting Diode
L2TP	Layer 2 Tunneling Protocol

M	
MSC	Mobile Switching Center
N	
NAT	Network Address Translation
P	
PSTN	Public Switched Telephone Network
POTS	Plain Old Telephone Service
PPTP	Point to Point Tunneling Protocol
R	
RTT	Radio Transmission Technology
S	
SOHO	Small Office Home Office
SCP	Service Control Point
SGSN	Serving GPRS Support Node
SDRAM	Synchronous Dynamic Random Access Memory
T	
TKIP	Temporal Key Integrity Protocol
U	
UMTS	Universal Mobile Telecommunications System
UL	up link, uplink
V	
VLR	Visitor Location Register
VPN	Virtual Private Network
W	
WAN	Wide Area Network
WCDMA	Wideband CDMA
Wi-Fi	Wireless Fidelity